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## NOTICE OF ALLOWANCE AND FEE(S) DUE

50255 7590 12/30/2008

MAGINOT, MOOR & BECK  
111 MONUMENT CIRCLE, SUITE 3000  
BANK ONE CENTER/TOWER  
INDIANAPOLIS, IN 46204

EXAMINER

MCKIE, GINA M

ART UNIT

PAPER NUMBER

2611

DATE MAILED: 12/30/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,852	04/11/2005	Anthony Sanders		2280

TITLE OF INVENTION: CLOCK SIGNAL EXTRACTION DEVICE AND METHOD FOR EXTRACTION A CLOCK SIGNAL FROM DATA SIGNAL

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	03/30/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE** OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

## HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

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B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER:** Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

# **PART B - FEE(S) TRANSMITTAL**

**Complete and send this form, together with applicable fee(s), to:** Mail **Mail Stop ISSUE FEE**  
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**P.O. Box 1450**  
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 or Fax **(571)-273-2885**

**INSTRUCTIONS:** This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

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Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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nonprovisional	NO	\$1510	\$300	\$0	\$1810	03/30/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
MCKIE, GINA M	2611	375-376000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.  
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a **Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 \_\_\_\_\_  
 (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 \_\_\_\_\_  
 3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee  
☐ Publication Fee (No small entity discount permitted)  
☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.  
☐ Payment by credit card. Form PTO-2038 is attached.  
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature \_\_\_\_\_ Date \_\_\_\_\_  
 Typed or printed name \_\_\_\_\_ Registration No. \_\_\_\_\_

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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EXAMINER

MCKIE, GINA M

ART UNIT

PAPER NUMBER

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## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 584 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 584 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

**Notice of Allowability****Application No.**

10/530,852

**Applicant(s)**

SANDERS ET AL.

**Examiner**

GINA MCKIE

**Art Unit**

2611

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 30 June 2008.
2. ☒ The allowed claim(s) is/are 17-36.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some\* c) ☐ None of the:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.  
(a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached  
1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.  
(b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.  
**Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

/Gina McKie/  
Examiner, Art Unit 2611

## **DETAILED ACTION**

### ***Response to Amendment***

1. Acknowledgement is made of the amendments filed June 30, 2008 and September 02, 2008. Claims 17-36 remain pending in the application.

- Claims 17, 18, 24, 25, and 29 have been amended.
- No claims have been canceled.
- No claims are new.

### ***Response to Arguments***

#### **Drawings**

2. Applicant's arguments, see page 9 of REMARKS, filed June 30, 2008, with respect to the objection to figure 1 for lacking word labels, have been fully considered. The objection to the drawings has been withdrawn in view of the replacement drawing submitted June 30, 2008.

#### **Specification**

3. Applicant's arguments, see page 9 of REMARKS, filed June 30, 2008, with respect to the objection to the specification, including the abstract of the disclosure for containing legal phraseology, have been fully considered. The objection to the specification has been withdrawn in view of the replacement abstract submitted September 02, 2008.

#### **Claim Rejections – 35 USC § 112, first paragraph**

4. Applicant's arguments, see pages 9-10 of REMARKS, filed June 30, 2008, with respect to the rejections of claims 17, 24, and 29 under 35 USC § 112, first paragraph as failing to comply with the enablement requirement have been fully

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considered. The 35 USC § 112, first paragraph rejections of claims 17, 24, and 29 have been withdrawn in view of the amendment to the claims filed June 30, 2008.

**Claim Rejections – 35 USC § 103(a)**

5. Applicant's arguments, see pages 10-12 of REMARKS, filed June 30, 2008, with respect to the rejection of independent claims 17, 24, and 29 under 35 USC § 103(a) as being unpatentable over Nakano (US 5,745,468) in view of Aoki et al. (US 6,236,696) have been fully considered and are persuasive. The 35 USC § 103(a) rejection of claims 17, 24, and 29 has been withdrawn.

As such, claims 17, 24, 29, and their dependents therefrom are put in condition for allowance.

**EXAMINER'S AMENDMENT**

6. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Russell Fowler on December 19, 2008.

The claims in the application have been amended as follows:

**(1) Claim 17:**

A clock signal extraction device for extracting an extracted clock signal out of a periodic data signal, comprising:

a first clock generator circuit configured to generate a rising edge clock signal, the first clock generator circuit having a first output;

a first phase detector configured to detect a first phase difference between a rising edge of the periodic data signal and a rising edge of the rising edge clock signal, the first phase detector having a first input connected to the first output to form a first loop, and wherein the first clock generator circuit and the first phase detector cooperate to reduce the detected first phase difference,

a second clock generator circuit configured to generate a falling edge clock signal, the second clock generator circuit having a second output;

a second phase detector configured to detect a second phase difference between a falling edge of the periodic data signal and a falling edge of the falling edge clock signal, the second phase generator having a second input connected to the second output to form a second loop, and wherein the second clock generator circuit and the second phase detector cooperate to reduce the detected second phase difference;

a third clock generator circuit configured to generate the extracted clock signal and;

a controller comprising a phase pump and a loop filter configured to control the third clock generator circuit based on an average of the first phase difference and the second phase difference.

**(2) Claim 18:**

The clock signal extraction device according to claim 17, wherein the controller is configured to process said first phase difference and said second

phase difference to control generation of the extracted clock signal by the third clock generator circuit.

**(3) Claim 24:**

An arrangement for extracting data, including:

a clock signal extraction device for extracting an extracted clock signal out of a periodic data signal, comprising

a first clock generator circuit configured to generate a rising edge clock signal, the first clock generator circuit having a first output,

a first phase detector configured to detect a first phase difference between a rising edge of the periodic data signal and a rising edge of the rising edge clock signal, the first phase detector having a first input connected to the first output to form a first loop, and wherein the first clock generator circuit and the first phase detector cooperate to reduce the detected first phase difference,

a second clock generator circuit configured to generate a falling edge clock signal, the second clock generator circuit having a second output;

a second phase detector configured to detect a second phase difference between a falling edge of the periodic data signal and a falling edge of the falling edge clock signal, the second phase generator having a second input connected to the second output to form a second loop, and wherein the second clock generator circuit and the second phase detector cooperate to reduce the detected second phase difference,



a third clock generator circuit configured to generate the extracted clock signal and a controller comprising a phase pump and a loop filter configured to control the third clock generator circuit based on an average of the first phase difference and the second phase difference; and a data extraction device configured to extract data from said periodic data signal according to a rate of said extracted clock signal.

**(4) Claim 25:**

The arrangement according to claim 24, wherein the controller is configured to process said first phase difference and said second phase difference to control generation of the extracted clock signal by the third clock generator circuit.

**(5) Claim 26:**

The arrangement according to claim 25, wherein said controller controls said third clock generator periodic to generate said clock signal such that the error rate of the extracted data is minimized.

**(6) Claim 27:**

The arrangement according to claim 24, wherein said data extraction device comprises a data sampler for sampling said circuit data signal.

**(7) Claim 29:**

A method for extracting an extracted clock signal out of a periodic data signal, comprising:

- (a1) generating a rising edge clock signal;

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(a2) detecting a first phase difference between a rising edge of the periodic data signal and the **[[a]]** rising edge of a rising edge clock signal;

(a3) feeding back the first phase difference to generate a subsequent rising edge clock signal having a reduced first phase difference;

(b1) generating a falling edge clock signal;

(b2) detecting a second phase difference between a falling edge of the periodic data signal and a falling edge of the **[[a]]** falling edge clock signal;

(b3) feeding back the second phase difference to generate a subsequent falling edge clock signal having a reduced second phase difference; and

(c) generating the extracted clock signal and controlling the extracted clock signal based on an average of a of the first phase difference and the second phase difference way using a phase pump and a loop filter.

**(8) Claim 32:**

The method according to claim 29, further comprising a step of: extracting data from said periodic data signal according to a rate of said extracted clock signal.

**(9) Claim 34:**

The method according to claim 33, wherein said periodic data signal is an optical periodic data signal.

**(10) Claim 35:**

The method according to claim 33, further comprising extracting data from said periodic data signal using a flip-flop.

**(11) Claim 36:**

The method according to claim 29, wherein said periodic data signal is an optical periodic data signal.

### REASONS FOR ALLOWANCE

7. Claims 17-36 are allowed.
8. The following is an examiner's statement of reasons for allowance:

The prior art of record fails to teach, alone or in combination, "**...generating the extracted clock signal** and controlling the extracted clock signal **based on an average of the first phase difference and the second phase difference** using a phase pump and a loop filter," as claimed in claims 17, 24, and 29.

Aoki et al. (US 6,236,696) is an exemplary reference from the relevant subclasses. However, Aoki discloses a duty judging circuit which generates duty information used by a data selector to judge an optimal phase suitable for a data decision. The duty judging circuit in Aoki does not use a first phase difference and a second phase difference for calculating the duty cycle. Instead, Aoki uses the absolute phase of a falling edge and the absolute phase of a rising edge forwarded to a subtracter. The subtracters calculate a duration of logical high or logical low level. The duty judging circuit of Aoki does not satisfy the claim limitations of Applicant's claims 17, 24, and 29 alone, nor in combination with Nakano (US 5,745,468) (Nakano being used to satisfy other limitations of the claims). Therefore claims 17, 24, 29, and their dependents therefrom contain allowable subject matter.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GINA MCKIE whose telephone number is (571)270-5148. The examiner can normally be reached on Mon-Fri, 9:00 AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Gina McKie/

Examiner, Art Unit 2611

/Shuwang Liu/

Supervisory Patent Examiner, Art Unit 2611